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ABSTRACT

Edits that can be performed by the processor who applies for federal campus-based student aid programs are discussed, along with a longer-term approach to assessing the efficacy of recommended edit checks. Attention is focused on the accuracy of data submitted by institutions on the application portion of the Fiscal Operations Report and Application to Participate (FISAP). Recommended are additional internal edits, as well as cross-year edit checks and cross-data source edit checks using Pell Grant and Higher Education General Information Survey data. Recommendations for long-term assessment include developing a data gathering and analysis plan for analyzing the validity of potential edits and reasonable tolerances for these edits. Principles embodied in the approach include comprehensiveness, efficiency, congruity, and verifiability. There is a need to clearly define what constitutes an error and to analyze data collected at colleges to determine the comparability of certain types of data. The 13 current edit checks used on the FISAP's application portion should be considered for incorporation in the FISAP application editing system. (SW)

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IMPROVING QUALITY IN THE APPLICATION PORTION OF THE PROCESSING FISCAL OPERATIONS REPORT AND APPLICATION TO PARTICIPATE

AN APPROACH TO DEVELOPING AND REFINING EDIT CHECKS

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HE 018 140

August 1984

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INTRODUCTION

Advanced Technology has conducted various analyses associated with the Fiscal Operations Report and Application to Participate (FISAP) in the Campus-Based student aid programs. These analyses are part of the Title IV Quality Control study that will assess for the Division of Quality Assurance (DQA), Office of Student Financial Assistance (OSFA) the quality of delivery of Campus-Based student aid funds to students enrolled at institutions participating in the three Campus-Based programs.

The first activity of the FISAP analysis involved data collection at the Department of Education (ED). Advanced Technology data collectors conducted a series of manual edits for the 275 institutions participating in the Campus-Based programs that were sampled for the Spring 1984 Title IV Quality Control data collection.

These edits included cross-year comparisons of FISAP data elements and cross-data source comparisons with the Pell Grant Disbursment System file and Higher Education General Information Survey (HEGIS) files. Institutions that were found to have discrepancies in FISAP data elements were identified for further data retrieval. The results of this first activity are contained in a report entitled "Analysis of Error Associated with the Application and Allocation Aspects of the Campus-Based Programs: Results from Initial Collection," submitted to DQA in May 1984.

The second activity consisted of a supplemental FISAP data collection conducted during the Title IV data collection at those institutions identified through the manual edits described above. Financial aid administrators and registrars were asked to resolve extant discrepancies. These data are still being analyzed and a report will be produced in the next several months.

The focus of this report is the recommendation of edits that can be performed on the application portion of the FISAP by the processor including recommended initial tolerances for these edit checks. However, since these tolerances have been developed through qualitative analytic methods and since data are currently unavailable with which to establish tolerances through quantative methods, the report also proposes a longer-term approach to assessing the efficacy of recommended edit checks, the adequacy of recommended tolerances. This approach also includes

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developing a data gathering and analysis plan for analyzing the validity of potential edits and reasonable tolerances for these edits.

Background and Nature of the Problem:

The application and funding process for the three Campus-Based programs, College Work-Study (CW-S), National Direct Student Loan (NDSL), and Supplemental Educational Opportunity Grants (SEOG) is complex, time-consuming, and potentially error prone. Campus-Based student financial aid funds are allocated to participating institutions in each state by a process in which the overall financial need of students at one eligible institution is compared to the need of students attending other applicant institutions in that state and in the nation as a whole. For both the NDSL and CW-S programs, an institution receives an allocation computed in three general stages from data filed by institutions on the application portion of the FISAP:

(1) A conditional guarantee

(2) A state increase based on its "fair share" of the state apportionment

(3) A national increase based on its "fair share" of the national appropriation.

For SEOG, the allocation is computed in four general stages (for previous program participants):

(1) A conditional guarantee

(2) An initial year (IY) state increase based on its "fair share" of the state's IY apportionment

(3) An IY national increase based on its "fair share" of the national IY portion of the SEOG appropriation

(4) A continuing year (CY) national increase based on its "fair share" of the national CY portion of the SEOG appropriation.

Through more than a decade of evolution the attempts to increase the validity of application forms and ensure more accurate and more equitable distribution of funds have complicated the application as well as application processing. The potential for errors by the institutions and the processing system has also increased. This increase in complexity and resultant increases in the opportunity for error, combined with an

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increasing number of participating institutions (currently over 4,000), have caused a good deal of attention to be focused on FISAP processing by OSFA and others.

This report focuses on one area that continues to receive attention, namely, the accuracy of data submitted by institutions on the application portion of the FISAP. These data are critical since they determine, to a degree, the institutions' funding level for each of the Campus-Based programs.

Application Processing

A major area of OSFA concern relates to the computerized processing of the FISAP by the contractor which produces an institution's initial allocation. The allocation is based on the funding formula, current regulations, and the program appropriations. Last-minute changes to regulations and delays in receiving the appropriations result in last-minute modifications to program modules in the processing system. Edit checks must be modified to accomodate these changes, potentially resulting in processing delays. While such modifications cannot be controlled, they must be considered in developing an approach to systematic application edit checks.

Ideally, institutions would like to know in January how much money will be available to award to students for the following academic year. In recent years many institutions have not received a final allocation before awarding aid to students. In part this delay has been caused by the last-minute nature of the changes noted above and delays in the funding process. However, when considering a comprehensive system of edit checks, care must be taken in order not to overburden a large number of institutions with error messages and correction requests which would slow corrections and processing required to produce the final allocation. Such edits can quickly reach the point of diminishing return.

Follow-up Procedures

Once schools have received error messages noting specific line items on the FISAP which failed to pass system edit checks, it is their responsibility to make the necessary corrections and forward the corrected items to OSFA for reprocessing. Although certain uncorrected items will trigger a flag in the system and the institution

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will be put on "hold," other correction failures go through the system and still permit an institution to receive an initial award. In some cases that initial allocation is in error and the institution unknowingly awards funds it is not entitled to award. Inability of OSFA to follow up the status of corrections and appeals to initial allocations is due in large part to insufficient staff to track corrections and appeals which annually come from an increasing percentage of over 4,000 schools participating in the program. System tracking procedures for corrections submitted for reprocessing (e.g., aging reports) and prompt resolution of allocations for "hold" institutions are support follow-up procedures which are contractor responsibilities. Each of these areas affects the quality and integrity of the FISAP process and is another aspect of OSFA concern. This report deals in a limited manner with these areas.

GENERAL APPROACH TO DEVELOPING EDIT CHECKS

The Campus-Based processor's draft quality control plan identifies 109 edit checks for the FISAP. However, only 13 of these edits relate to the application portion of the FISAP. In addition, these edits are restricted primarily to internal arithmetic and consistency tests.

The edit checks recommended in this report include several additional internal edits. Also recommended are cross-year edits checks and cross-data source edits checks using Pell and HEGIS data.

Fundamental Design Principles

The development of the series of edit checks enumerated in the following sections is based on several principles which focus on the inherent qualities of an effective quality control system for the application portion of FISAP and its relationship to the Campus-Based delivery system, particularly the capabilities of the two main actors, institutions, and ED. The principles embodied in our approach include:

- Comprehensiveness
- Efficiency
- Congruity

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- Verifiability

Comprehensiveness as a design principle ensures that all meaningful edits will be conducted and all possible data sources will be utilized. Efficiency has more dimensions as a design principle. The first dimension considers the capability of the system to discriminate between erroneous data and reasonable year to year changes in data that often occur at institutions subject to dynamic circumstances. A system of edit checks must be able to identify large numbers of errors in a systematic rather than random fashion and to target error prone cases.

The second dimension of the efficiency principle is the ability to elicit changes in data elements from institutions and to track and incorporate these changes into the processing system expeditiously. Consequently, neither an inordinately large number of edits nor an unnecessarily large number of cases, as discussed above, should be produced. Either condition would have adverse impacts on institutions and the ED staff and processor.

The next design principle is congruity, which implies that the treatment assigned relates directly to the importance of the data item and the reliability of the data sources and tolerance levels used in the edits. The last design principle is to maximize the number of edits that have directly verifiable information.

Approach

A two staged approach to developing an effective set of edit checks is proposed. This approach is proposed for two reasons. First, as our prior reports indicated, there is no clear definition or determination of what constitutes an error. Second, a preliminary analysis of our data collection at institutions raised significant questions about direct comparability of certain types of comparison data. This would suggest that more detailed analysis is required.

The first stage consists of a thorough review of the current edits and the application document in order to develop, evaluate, and recommend edit checks for implementation for this processing year. Potential edits were also identified, but are not recommended for implementation this year. Rather they are recommended for further analysis and implementation during the next processing year. Initial tolerance

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levels are recommended for this processing year. These were developed through qualitative analysis, including analysis of edit tolerance structures and levels used in other processing systems. First stage activities included the following:

- Review processor's draft QC plan
- Analyze other processing systems
- Analyze proposed edits and the application document
- Review edits proposed in the QC plan, as well as omissions
- Develop comprehensive list of potential edits
- Identify data sources
- Develop initial tolerances
- Identify edits to recommend for further analysis and possible implementation during 1984-85 processing year.

The results of this phase are presented in the next section. Briefly, the results include additional internal edits not covered in the QC plan; internal or external data sources for each of the 24 edits developed; and a tolerance structure that is sensitive both to magnitude of the change in data elements and the reliability of the data sources used for comparison.

The second phase of the proposed approach has two objectives and achieves these through developing an analysis plan and conducting longer term analysis. The first of these objectives is to refine the tolerance levels based on current processing year performance and cross year analysis. Measures of performance could include the rate of edit failure, magnitudes and frequencies of corrections.

The second objective concerns the collection and analysis of data with which to assess the feasibility of edits proposed in the following section but not recommended for implementation during this processing year. In addition, analysis will be conducted to identify additional edits or more elegant and efficient means of conducting edits. The approaches that will be investigated include error prone selection and multi-level edits. Multi-level edits could include sequencing edits so that an application that fails an initial edit would be subject to a battery of other edits to attempt to determine

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whether the data are the result of legitimate changes in characteristics or actual errors. The feasibility of multi-level treatment for edit failures must also receive careful attention. For instance, small changes, even though they are suspected to be in error can simply be flagged and process may continue. However, errors of large magnitudes or patterns may require putting an application on hold.

We propose to submit such an analysis plan in 60 to 90 days.

DESCRIPTION OF POTENTIAL FISAP EDITS

The optimum machine editing system for processing the application portion of the FISAP should perform three functions. The system first must ensure that data reported on the FISAP is internally consistent. Checks should be made to make certain that the respondent's arithmetic is correct, that all required entries have been made, and that the relationships between data are logical. Second, since institutions annually submit the FISAP, the editing system should ensure the cross-year consistency of data. Most data elements on the FISAP should not change dramatically from year-to-year. Inasmuch as the prior year FISAP files can be considered "clean," they should be considered as a good base for evaluating values on the current year FISAP. Finally, the optimum editing system should ensure the consistency of FISAP data with other higher education data collected by the Department of Education. The Pell Grant Disbursement System and HEGIS, for instance, collect some data which are definitionally consistent with data collected on the FISAP.

Figure 1 shows the 13 edit checks currently used on the application portion of the FISAP. As the figure shows, the current edits address only the internal consistency of FISAP data. As such, the current editing system is limited in the kind of errors and inconsistencies it can detect. A FISAP form, for example, may have data which is internally consistent--and, therefore, judged "clean" by the current system--yet have errors which have a direct and possibly significant impact on the distribution of Campus-Based aid.

Experience conducting manual validation of FISAPs from 275 sampled institutions has suggested 24 specific edit checks that should be considered for incorporation in the FISAP application editing system. The 24 edits which are specified in Figure 2

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1. Institutions with expended funds in the fiscal operations report year must designate a request for funds for the upcoming award year on page 11, section A, lines 1, 2, 3, 4, or 5.

2. Total expenditures on page 11, line 13 must equal the sum of the individual expenditures in lines 10, 11, and 12.

3. The NDSL FCC request, page 11, section A, line 2 must be less than the NDSL LOE request, page 11, section A, line 1.

4. When tuition revenue is on page 13, section E, line 15, column a, enrollment data must be entered on section G, line 36, column a, or lines 39 through 51, column a.

5. When tuition revenue is on page 13, section E, line 15, column b, enrollment data must be entered on section G, line 37, column b, or lines 39 through 51, column b.

6. Total dependent undergraduate eligible aid applicants on page 13, section F, line 35, column a, must equal the sum of lines 19 through 34, column a.

7. Total dependent graduate/professional eligible aid applicants on page 13, section F, line 35, column b must equal the sum of lines 19 through 34, column b.

8. Total independent undergraduate eligible aid applications on page 13, section F, line 35, column c, must equal the sum of lines 19 through 34, column c.

9. Total independent graduate/professional eligible aid applicants on page 13, section F, line 35, column d must equal the sum of lines 19 through 34, column d.

10. When total number of students is entered on page 13, section G, line 36, columns a or b, there must be no entries in lines 39 through 51, columns a and b.

11. When page 13, section G, has entries shown in lines 39 through 51, there must be no entries shown in section F, lines 19 through 35, columns b and d, and in section G, line 36, column b.

12. Total non-traditional continuing students on page 13, section G, line 51, column a must equal the sum of lines 39 through 50, column a.

13. Total non-traditional new starts on page 13, section G, line 51, column b must equal the sum of lines 39 through 50, column b.

FIGURE 1

DESCRIPTION OF CURRENT EDIT CHECKS
ON THE APPLICATION PORTION
OF THE FISAP

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A. INTERNAL CONSISTENCY CHECKS

	Data Elements	Section and Line Number References	Test/Error Condition
1.	• Pell Grant Expenditures	E16	If Pell Grant expenditures were reported in E16 then data for dependent or independent undergraduates must be reported in F35.
	• Undergraduate Dependent Applicants	F35	
	• Undergraduate Independent Applicants	F35	
2.	• Undergraduate Dependent Applicants	F35	The sum of dependent and independent undergraduates reported in F35 must be less than or equal to the undergraduate enrollment reported in G36a or the sum of continuing and new enrollment reported in G51a and G51b.
	• Undergraduate Independent Applicants	F35	
	• Undergraduate Enrollment -- Traditional	G36a	
	• Continuing Enrollment -- Nontraditional	G51a	
	• New Enrollment -- Nontraditional	G51b	
3.	• Graduate Dependent Applicants	F35	The sum of dependent and independent graduates/professionals reported in F35 must be less than or equal to the graduate/professional enrollment reported in G36b.
	• Graduate Independent Applicants	F35	
	• Graduate Enrollment	G36b	

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM

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B. CROSS-YEAR CONSISTENCY CHECKS

	Data Elements	Section and Line Number References	Test/Error Condition
1.	Institutional Grant Expenditures for Award Year 1977-78	E18	Institutional grant expenditures must equal corresponding data from last year's form.
2.	Undergraduate Tuition and Fees	E15a	Current year total undergraduate tuition and fees will be compared with corresponding data from last year's form. The current year data must be within the following tolerances which vary according to the level of last year's data:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
$ 0 - $ 499,999	± 60% of last year's data
500,000 - 999,999	± 50% of last year's data
1,000,000 - 9,999,999	± 40% of last year's data
10,000,000 - 19,999,999	± 30% of last year's data
20,000,000 and above	± 20% of last year's data

3.	Graduate Tuition and Fees	E15b	Current year total graduate tuition and fees when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
$ 0 - $ 499,999	± 60% of last year's data
500,000 - 999,999	± 50% of last year's data
1,000,000 - 9,999,999	± 40% of last year's data
10,000,000 - 19,999,999	± 30% of last year's data
20,000,000 and above	± 20% of last year's data

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

Data Elements	Section and Line Number References	Test/Error Condition
4. Pell Grant Expenditures	E16	Current year Pell Grant expenditures when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
$ 0 - $ 99,999	± 60% of last year's data
100,000 - 499,999	± 50% of last year's data
500,000 - 999,999	± 40% of last year's data
1,000,000 - 4,999,999	± 30% of last year's data
5,000,000 and above	± 20% of last year's data

Data Elements	Section and Line Number References	Test/Error Condition
5. State Grant Expenditures	E17	Current year state grant expenditures when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
$ 0 - $ 99,999	± 60% of last year's data
100,000 - 499,999	± 50% of last year's data
500,000 - 999,999	± 40% of last year's data
1,000,000 - 4,999,999	± 30% of last year's data
5,000,000 and above	± 20% of last year's data

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

	Data Elements	Section and Line Number References	Test/Error Condition
6.	• Undergraduate Dependent Applicants	F35	The sum of dependent and independent undergraduates for the current year when compared with corresponding data from last year's form must fall within the following tolerance ranges:
	• Undergraduate Independent Applicants	F35	

Level of Last Year's Data			Tolerance Ranges for This Year's Data
0	-	99	± 60% of last year's data
100	-	499	± 50% of last year's data
500	-	999	± 40% of last year's data
1,000	-	4,999	± 30% of last year's data
5,000	and above		± 20% of last year's data

7.	• Graduate Dependent Applicants	F35	The sum of dependent and independent graduates for the current year when compared with corresponding data from last year's form must fall within the following tolerance ranges:
	• Graduate Independent Applicants	F35	

Level of Last Year's Data			Tolerance Ranges for This Year's Data
0	-	99	± 60% of last year's data
100	-	499	± 50% of last year's data
500	-	999	± 40% of last year's data
1,000	-	4,999	± 30% of last year's data
5,000	and above		± 20% of last year's data

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

	Data Elements	Section and Line Number References	Test/Error Condition
8.	Undergraduate Enrollment -- Traditional	G36a	Current year undergraduate enrollment when compared with corresponding data from last year's form must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
0 - 99	± 60% of last year's data
100 - 499	± 50% of last year's data
500 - 999	± 40% of last year's data
1,000 - 4,999	± 30% of last year's data
5,000 and above	± 20% of last year's data

9.	Graduate Enrollment	G36b	Current year graduate/professional enrollment when compared with corresponding data from last year's must fall within the following tolerance ranges:

Level of Last Year's Data	Tolerance Ranges for This Year's Data
0 - 99	± 60% of last year's data
100 - 499	± 50% of last year's data
500 - 999	± 40% of last year's data
1,000 - 4,999	± 30% of last year's data
5,000 and above	± 20% of last year's data

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FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

	Data Elements	Section and Line Number References	Test/Error Condition
10.	• Continuing Enrollment -- Nontraditional	G51a	The sum of continuing and new enrollment for the current year when compared with corresponding data from last year's form must fall within the following tolerance ranges:
	• New Enrollment -- Nontraditional	G51b	

Level of Last Year's Data			Tolerance Ranges for This Year's Data
0	-	99	± 60% of last year's data
100	-	499	± 50% of last year's data
500	-	999	± 40% of last year's data
1,000	-	4,999	± 30% of last year's data
5,000	and above		± 20% of last year's data

11.	• Total Undergraduate Tuition and Fees	E15a	If total undergraduate tuition and fees increase by more than 10% when compared with last year's data, undergraduate enrollment in traditional institutions or the sum of continuing and new enrollment in nontraditional schools must not decrease by 10% or more.
	• Undergraduate Enrollment -- Traditional	G36a	
	• Continuing Enrollment -- Nontraditional	G51a	
	• New Enrollment -- Nontraditional	G51b	
12.	• Total Graduate Tuition and Fees	E15b	If total graduate tuition and fees increase by more than 10% when compared with last year's data, graduate enrollment must not decrease by 10% or more.
	• Graduate Enrollment	G36b	

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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B. CROSS-YEAR CONSISTENCY CHECKS (Continued)

	Data Elements	Section and Line Number References	Test/Error Condition
13.	• Total Undergraduate Tuition and Fees	E15a	If total undergraduate tuition and fees decrease by more than 10% when compared with last year's data, undergraduate enrollment in traditional institutions or the sum of continuing and new enrollment in nontraditional schools must not increase by 10% or more.
	• Undergraduate Enrollment -- Traditional	G36a	
	• Continuing Enrollment -- Nontraditional	G51a	
	• New Enrollment -- Nontraditional	G51b	
14.	• Total Graduate Tuition and Fees	E15b	If total graduate tuition and fees decrease by more than 10% when compared with last year's data, graduate enrollment must not increase by 10% or more.
	• Graduate Enrollment	G36b	
15.	• Pell Grant Expenditures	E16	If Pell Grant expenditures increase by 10% or more when compared with last year's data, the sum of dependent applicants with incomes below $26,999 and independent applicants with incomes below $8,999 must not decrease by 10% or more.
	• Dependent Undergraduate Applicants with Incomes From $0 - $26,999	F19 through F27	
	• Independent Undergraduate Applicants with Incomes From $0 - $8,999	F19 through F27	
16.	• Pell Grant Expenditures	E16	If Pell Grant expenditures decrease by 10% or more when compared with last year's data, the sum of dependent applicants with incomes below $26,999 and independent applicants with incomes below $8,999 must not increase by 10% or more.
	• Dependent Undergraduate Applicants with Incomes From $0 - $26,999	F19 through F27	
	• Independent Undergraduate Applicants with Income From $0 - $8,999	F19 through F27	

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FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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C. CONSISTENCY CHECKS WITH OTHER DATA BASES

	Data Elements	Section and Line Number References	Test/Error Condition
1.	• Total Undergraduate Tuition and Fees	E15a	The sum of total tuition and fees for undergraduates and graduates must not differ by plus or minus 10% when compared with comparable data on Part A, Line 1 of HEGIS' Financial Statistics Survey.
	• Total Graduate Tuition and Fees	E15b	
2.	Pell Grant Expenditures	E16	Pell Grant expenditures must not differ by plus or minus 10% when compared against comparable data on the Pell Grant Disbursement System's Universe File.
3.	• Undergraduate Enrollment -- Traditional	G36a	The sum of undergraduate and graduate enrollment must not differ by plus or minus 10% when compared with the sum of lines 1, 10, 11, 15, 24, and 25 from columns 13 and 14 of HEGIS's Fall Enrollment Survey.
	• Graduate Enrollment	G36b	
4.	• Type of Institution	A4	If the institution is private, nonprofit, the ratio of undergraduate enrollment to total undergraduate tuition and fees must not differ by more than plus or minus 25% when compared with undergraduate tuition and fees reported on HEGIS' Institutional Characteristics Survey.
	• Total Undergraduate Tuition and Fees	E15a	
	• Undergraduate Enrollment	G36a	
5.	• Type of Institution	A4	If the institution is private, nonprofit, the ratio of graduate enrollment to total graduate tuition and fees must not differ by more than plus or minus 25% when compared with graduate tuition and fees reported on HEGIS' Institutional Characteristics Survey.
	• Total Graduate Tuition and Fees	E15b	
	• Graduate Enrollment	G36b	

FIGURE 2

SPECIFICATIONS FOR ADDITIONAL MACHINE EDITS FOR THE CAMPUS-BASED SYSTEM (Continued)

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address all three edit check functions: additional internal consistency checks, cross-year comparisons, and comparisons with other higher education data files. Figure 2 describes each of the proposed edits, provides the data elements which each edit addresses, and references the section and line number of the data element on the form. As Figure 2 indicates, the proposed edits address only those data items in Sections E, F, and G on the application portion of the FISAP which are critical in determining an institution's need for Campus-Based aid.

Proposed Internal Consistency Checks

Three edits which would check to make sure that the relationships between certain data items are logical are proposed. The first edit would ensure that when Pell Grant expenditures are reported in Section E, a figure for total undergraduate eligible aid applicants is also reported in Section F. The second two edits would make sure that the number of eligible aid applicants reported in Section F is less than or equal to the institution's total Fall enrollment reported in Section G.

Recommendation

We recommend that OSFA incorporate these three internal consistency checks into the FISAP editing system for the upcoming processing year. The three edits address Pell Grant expenditures, number of aid applicants, and total enrollment, three data elements which our field work suggests are among the most often misreported. The three edits, by checking the consistency of the three data elements, would uncover misreporting that the current system is not capable of identifying.

Proposed Cross-Year Consistency Checks

Sixteen edits which check an institution's cross-year reporting consistency are proposed. In the first edit, a cross-year comparison is made with not tolerance provided. In the next 9 edits, a critical item is compared cross-year using a tolerance range. If the values of the two items being compared fall within the tolerance range, the item would not be considered in error. The proposed tolerance ranges are expressed as proportions of current year data to last year's data. For example, if an institution reported 80 for its undergraduate enrollment last year its tolerance would

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be plus or minus 60 percent. Its tolerance range for this year's data would be 32 (80 - (.60 x 80) = 32) to 128 (80 + (.60 x 80) = 128). The tolerances vary depending on the amounts reported on last year's form. Ranges are broader for small amounts and more restrictive for large amounts since significantly more cross-year variation should be expected at small institutions.

Extensive quantitative analysis of trends in FISAP reporting and the possible impact of various tolerance ranges on the frequency of edit failure was not possible due to the limited scope of the task. Instead, the proposed tolerance ranges were assigned based on experience doing manual cross-year comparisons on 275 samples FISAPs and on a review of cross-year edits used by the HEGIS surveys. The HEGIS program has been using cross-year comparisons for several years and as a result has been able to follow trends and refine the tolerance ranges it uses.

The final six cross-year consistency checks examine the relationship of change in two or more data elements. In four of the edits, change in total tuition and fees is compared to change in total enrollment (e.g., if total tuition and fees increase by more than 10 percent, then enrollment should not decrease by more than 10 percent). In the other two edits, change in total Pell Grant expenditures is compared to change in the total number of low income eligible aid applicants (e.g., if Pell Grant expenditures increase by 10 percent or more, the number of low income applicants should not decrease by 10 percent or more). A tolerance range of 10 percent has been used in these comparisons since the relationship between the data elements is not perfect. For instance, it is possible for total Pell Grant expenditures to rise and the number of low income applicants to drop due to an increase in tuition and fees or a change in the Family Contribution Schedule. Likewise, enrollment may drop and total tuition and fees rise due to an across-the-board increase in tuition.

Recommendation

We recommend that OSFA incorporate the 16 cross-year checks on a test basis during the upcoming year recognizing that the proposed tolerance ranges were developed through qualitative analytic methods and that additional analysis will be needed to refine them. This analysis should be conducted on an ongoing basis in order that this refinement continue and the tolerance not become outmoded.

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Proposed Consistency Checks With Other Data Bases

Five edits are proposed which would compare critical data elements from the FISAP with data collected by HEGIS and the Pell Grant program. Tolerance ranges are recommended for the comparisons to account for the following two problems in validating FISAP data with other data sources:

- **Ongoing changes to the Pell Universe and HEGIS files.** The figure for Pell Grant expenditures on the FISAP may not match what the Pell Universe File contains for either current authorization or net expenditures because of an onging reconciliation process that continues for months after the award year. Also, as part of the editing process the HEGIS files are revised over a period of several months following the original submission of the HEGIS form.

- **Definitional Differences.** In two of the proposed edits, an average tuition and fees figure would be calculated (total tuition and fees divided by enrollment) and compared against a tuition and fees figure reported for private institutions on HEGIS' Institutional Characteristics Survey.* That survey, however, asks for the modal (most common) tuition and fees rather than the campus-wide average. Thus, a rather liberal tolerance of 25 percent is suggested in making the comparison.

Recommendation

We recommend that ways of overcoming the problems we identified in the manual validation of 275 sampled forms be explored before incorporating comparisons with outside data bases into the current editing system. These problems, in addition to the two comparison problems already noted, include:

- **Difficulty of Identifying Institutions.** The HEGIS and FISAP files have no common identifier for the institution other than its name. HEGIS uses the FICE code as the numeric identifer for its institutions, while FISAP uses the entity number.

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*There is not comparable data for total public institution tuition and fees on the Institutional Characteristics Survey. Data is collected on that survey for in-state and out-of-state tuition and fees for public institutions. Without data on in-state and out-of-state enrollments, it is impossible to calculate a campus-wide average tuition and fees figure.

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- **Different Reporting Units.** The definition of a reporting unit is different for FISAP, Pell, and HEGIS. A multi-campus institution, for example, may file a single combined report for FISAP and separate reports for Pell.

- **Different Number of Reporting Units.** Not all institutions who file a FISAP file Pell and HEGIS reports. For example, there are many proprietary schools who file the FISAP form but not the HEGIS surveys.